

REMARKS

Claims 1-15 are currently pending. Claims 1, 9, 12, and 14 are amended and claims 16 and 17 are canceled. No new matter is presented. All pending claims 1-15 stand rejected under 35 U.S.C. 103(a). The above amendments and the following remarks are considered by Applicants to overcome each rejection raised by the Examiner and to place the application in condition for allowance. An early Notice of Allowance is therefore requested.

Claims 1-15 stand rejected as being unpatentable over Takagi (U.S. Patent No. 6,536,880) in view of Murai (U.S. Publication 2003/76007). This rejection is traversed and believed overcome in view of the following discussion.

Takagi discloses a plate shaped piezoelectric actuator formed from ten piezoelectric sheets that are stacked in a laminated configuration. Drive electrodes 36 are formed on the upper surface of each piezoelectric sheet 26, 28, and 30 at positions that correspond to pressure chambers provided on a cavity plate.

Murai discloses a piezoelectric thin film element with superior piezoelectric properties in which the condition of the crystal of the piezoelectric thin film is controlled. The piezoelectric thin film element includes a top electrode, a bottom electrode, and a piezoelectric thin film formed between the top electrode and the bottom electrode, wherein the piezoelectric thin film is structured so as to comprises a first layer located nearest to the bottom electrode and second layers that are located nearer to the top electrode than the first layer and that have a thickness greater than that of the first layer.

Applicants respectfully traverse the rejection of claims 1-15 under 35 U.S.C. 103(a). Takagi discloses a piezoelectric actuator 20 including five piezoelectric layers 25, 26, 27, 28, 29 and five pairs of electrodes layers 35, 36 each pair of which sandwiches a corresponding one of the five piezoelectric sheets 25-29. However, as admitted by the Examiner, Takagi fails to disclose the piezoelectric layers including at least one first piezoelectric layer having a first

thickness, and at least one second piezoelectric layer having a second thickness that is greater than the first thickness. In addition, Takagi fails to teach or suggest that the first thickness of the at least one first piezoelectric layer is equal to a distance between two electrodes of a first pair that cooperate with each other to sandwich the at least one first piezoelectric layer, or that the second thickness of the at least one second piezoelectric layer that is greater than the first thickness is equal to a distance between two electrodes of a second pair that cooperate with each other to sandwich the at least one second piezoelectric layer.

Murai fails to cure the deficiencies of Takagi. Murai states, at Paragraph [0024], that reducing the thickness of the first precursor layer...and reducing the thickness during annealing process make it possible to appropriately anneal the first layer and to obtain a fine crystal film with a high (100) plane degree of orientation, and that making the thickness of the second layer...greater than the thickness of the first layer improves productivity. Moreover, Murai states, in the same paragraph, that since each layer formed above the first layer is formed while being sequentially crystallized in accordance with the condition of the crystal of the first layer having a fine crystal structure, the layers form a thin film comprising fine crystals even though thickness during annealing is increased. Thus, the first layer 431 having a small thickness and the second layers 432-436 each having a great thickness cooperate with each other to function as a single, integral piezoelectric thin film 43 that is sandwiched by a single pair of electrodes 44, 45.

Thus, Murai fails to teach or suggest (a) providing at least three electrode layers including a first pair of electrode layers which cooperate with each other to sandwich at least one first piezoelectric layer having a first thickness, and a second pair of electrode layers which cooperate with each other to sandwich at least one second piezoelectric layer having a second thickness greater than the first thickness, or (b) that the first thickness of the at least one first piezoelectric layer is equal to a distance between the two electrodes of the first pair

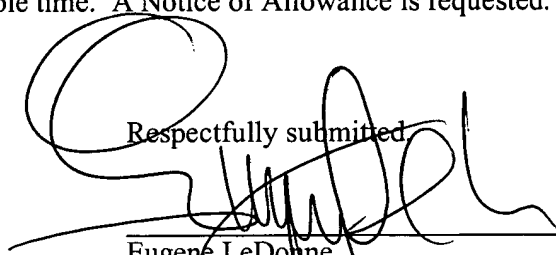
and the second thickness of the at least one second piezoelectric layer that is greater than the first thickness is equal to a distance between the two electrodes of the second pair.

For the above-indicated reasons, it is respectfully submitted that it would not have been obvious to the skilled person to provide the piezoelectric actuator as recited in claim 1 or the ink jet printer head as recited in claim 12, in the light of Takagi even in view of Murai. Therefore, Applicants respectfully request the withdrawal of the rejection to claims 1-15 under 35 U.S.C. 103.

Claims 2-11 and 13-15 are dependent upon independent claims 1 and 12. Therefore, it is submitted that for at least the reasons mentioned above, these claims recite patentable subject matter. Accordingly, Applicants request the withdrawal of the rejection of claims 2-11 and 13-15 under 35 U.S.C. 103(a).

In view of the above remarks, Applicants submit claims 1-15 recite subject matter that is neither taught nor suggested by the applied references. Thus, for the reasons presented above, claims 1-15 are believed by Applicant to define patentable subject matter and should be passed to issue at the earliest possible time. A Notice of Allowance is requested.

Respectfully submitted



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